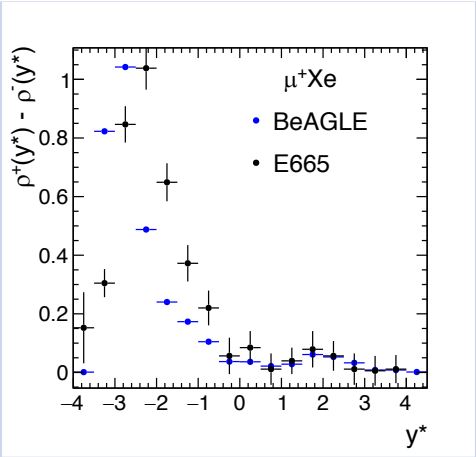
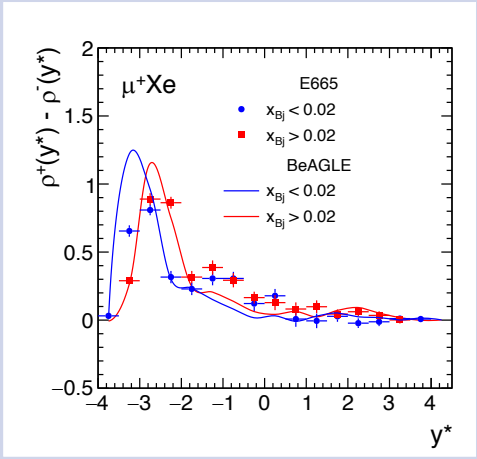
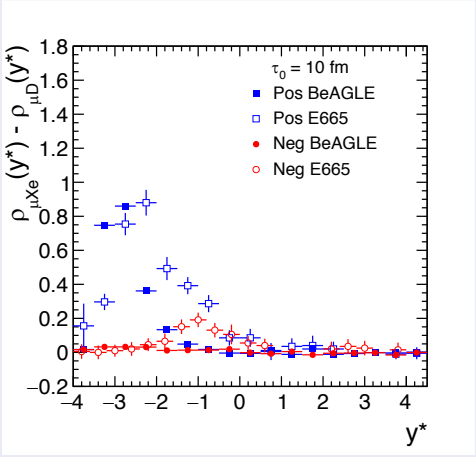
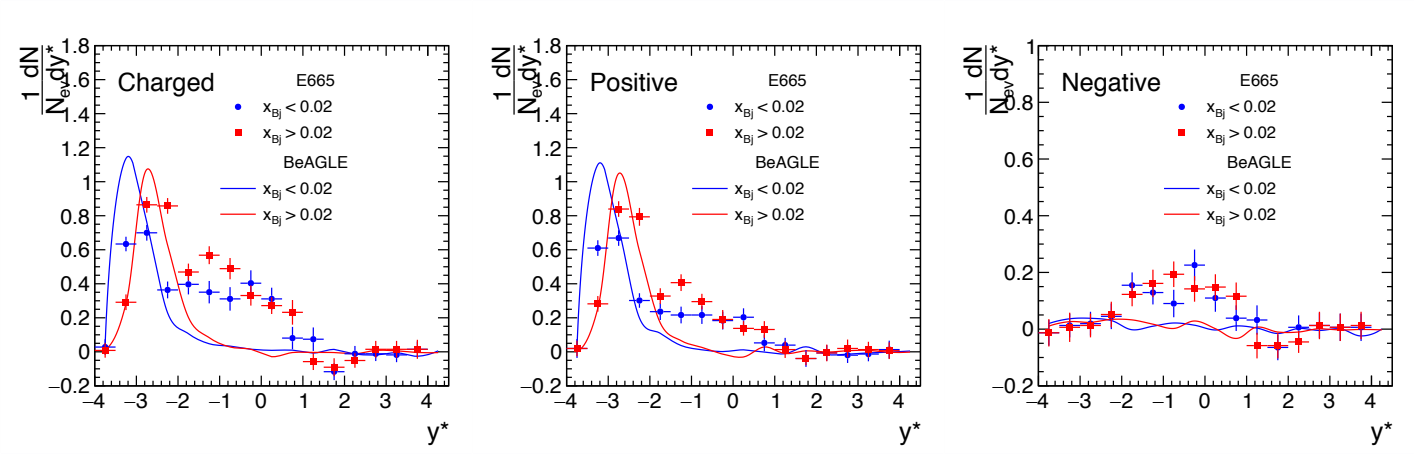
E665 paper

	Paper published in 1994 https://doi.org/10.1007/BF01413096	**Paper published in 1995** https://link.springer.com/article/10.1007/BF01571879
Kinematic quantities	$\theta > 3.5\ mr,$	
	$Q^2 > 1\text{GeV}^2,$	$Q^2 > 1\text{GeV}^2,$
	$8 < W < 30\ \text{GeV},$	$8 < W < 30\ \text{GeV},$
	$x_{Bj} > 0.002,$	$0.002 < x_{Bj} < 0.3,$
	$0.1 < \upsilon/E_\mu < 0.85,$	$50 < \upsilon < 400\ \text{GeV},$
Particle mass assign ($x_F(m_\pi)$ is the Feynman-x for a particle assuming a pion mass)	Therefore all positive hadrons in the data with $x_F(m_\pi)$ less than -0.2 are assigned the proton mass, all other hadrons are treated as pions. $x_F(m_\pi)$ <-0.2 proton $x_F(m_\pi)$ >-0.2 pion	Grey tracks proton $x_F(m_\pi)$ <-0.2 proton $x_F(m_\pi)$ >-0.2 pion A particle is called a "grey track", if it has a momentum between 200 and 600 MeV/c, and if the streamer density as observed in the streamer chamber picture is clearly higher than that of a minimum ionizing particle. The grey tracks are assumed to be predominantly protons.
Moentum p>200 MeV In the present analysis only charged hadrons with a momentum greater than 200 MeV/c are considered, because particles at lower momentum are often absorbed in the target.		
Data correction	corrected	uncorrected

	94 paper	95 paper
Hadronic net charge	 Peak is in different position Peak position: BeAGLE: -3.0<y*<-2.5 E665: -2.5<y*<-2	 1.Disagree in shadowing region($x_{Bj} < 0.02$) Agree in non-shadowing region($x_{Bj} > 0.02$) 2. The peak of BeAGLE in shadowing region is more backward than that in non-shadowing region.
Difference of the normalized cms-rapidity distributions between muXe and muD scattering	 Peak position: BeAGLE: -3.0<y*<-2.5 E665: -2.5<y*<-2	 1.Disagree in shadowing region($x_{Bj} < 0.02$) Agree in non-shadowing region($x_{Bj} > 0.02$) 2. The peak of BeAGLE in shadowing region is more backward than that in non-shadowing region.

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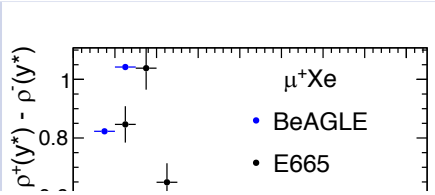
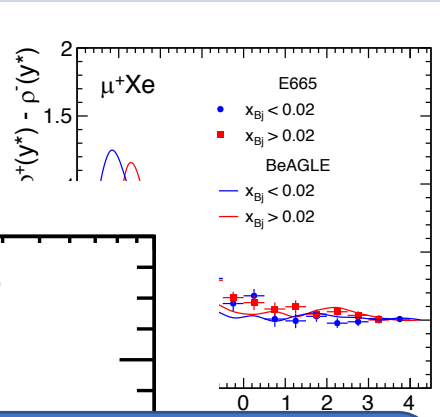
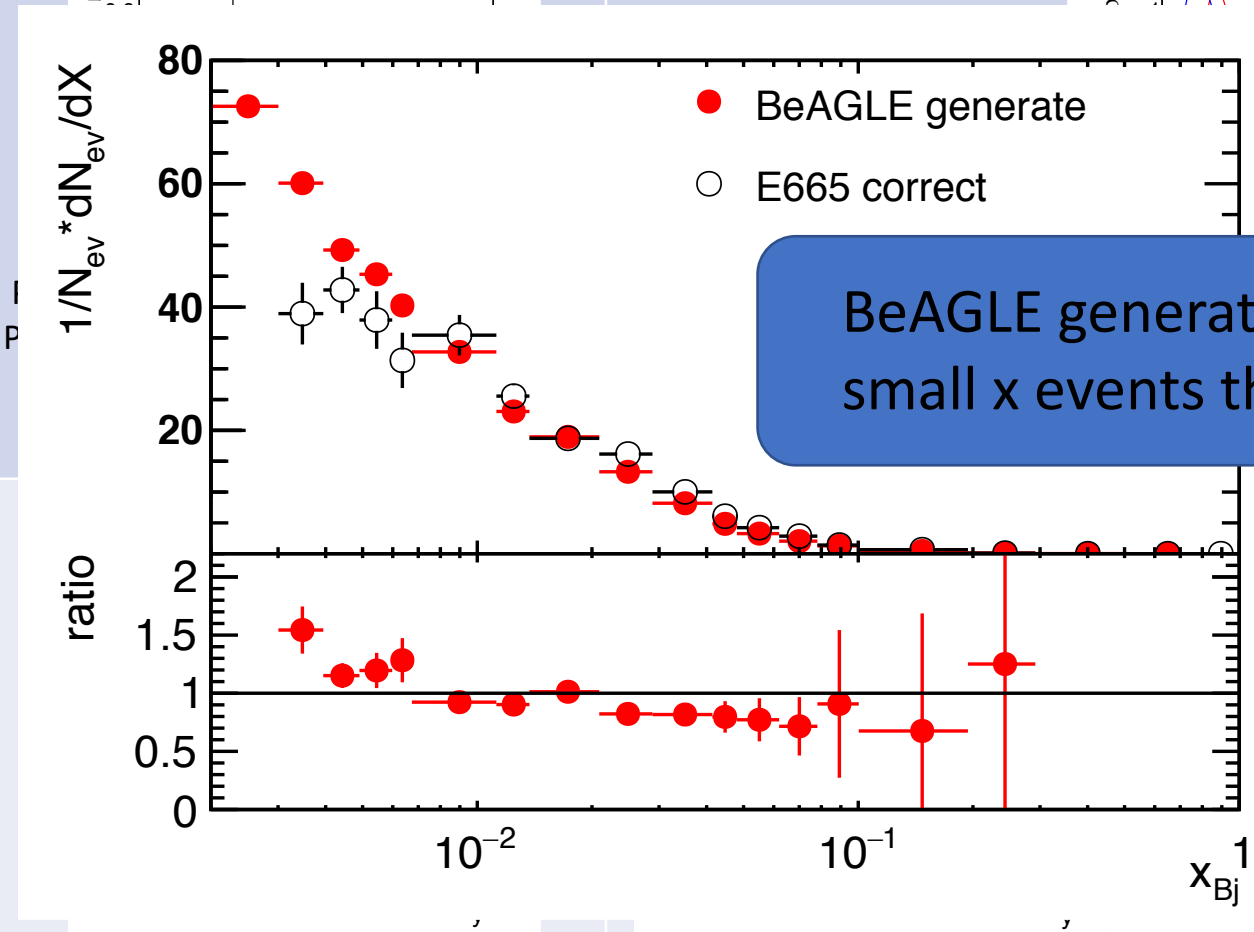
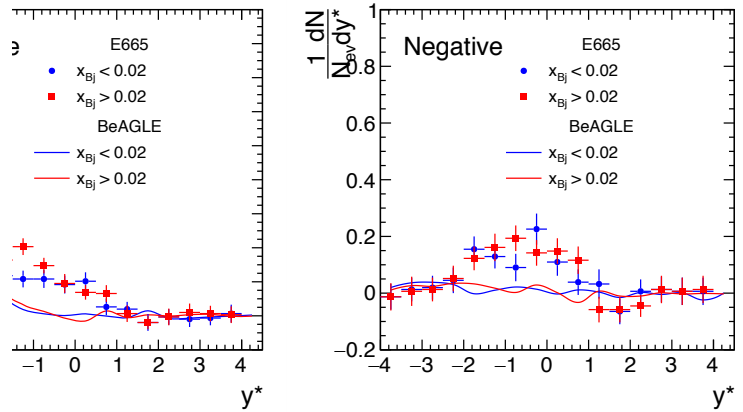
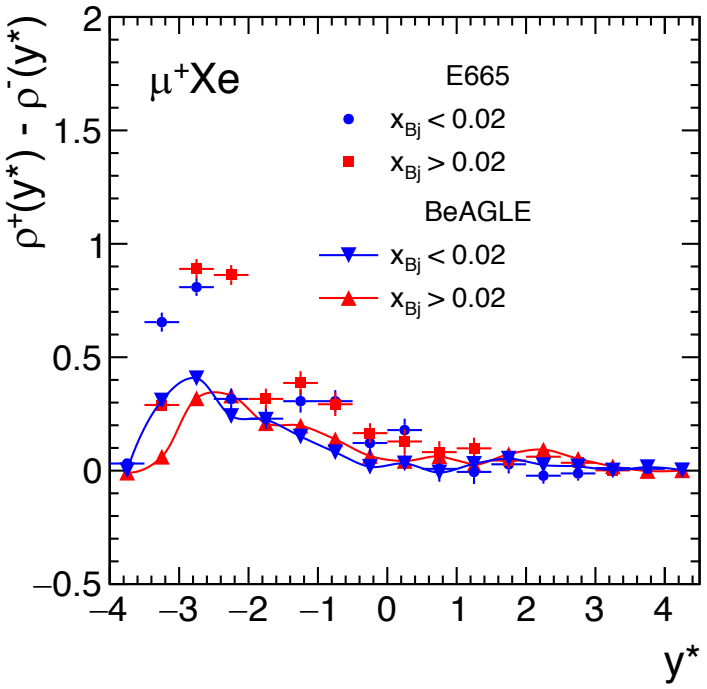
Hadronic net charge		
Difference of the normalized cms-rapidity distributions between muXe and muD scattering	Peak position: BeAGLE: -3.0<y*<-2.5 E665: -2.5<y*<-2	1.Disagree in shadowing region($x_{Bj} < 0.02$) Agree in non-shadowing region($x_{Bj} > 0.02$) 2. The peak of BeaGLE in shadowing region is more backward than that in non-shadowing region.



BeAGLE generate more small x events than E665.



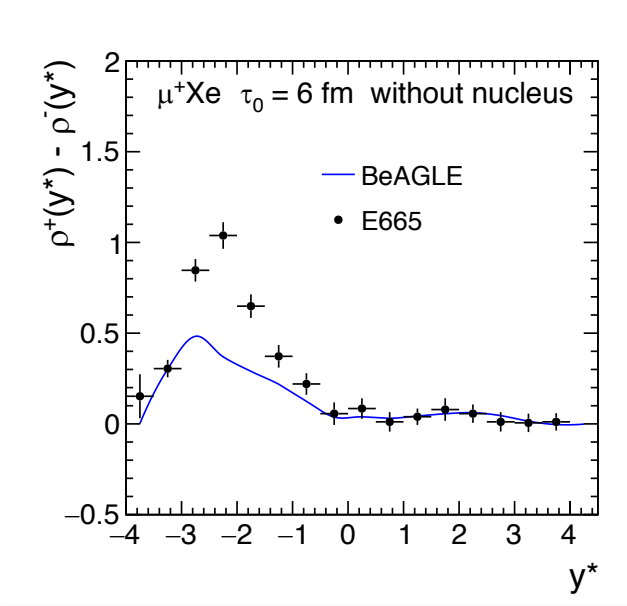
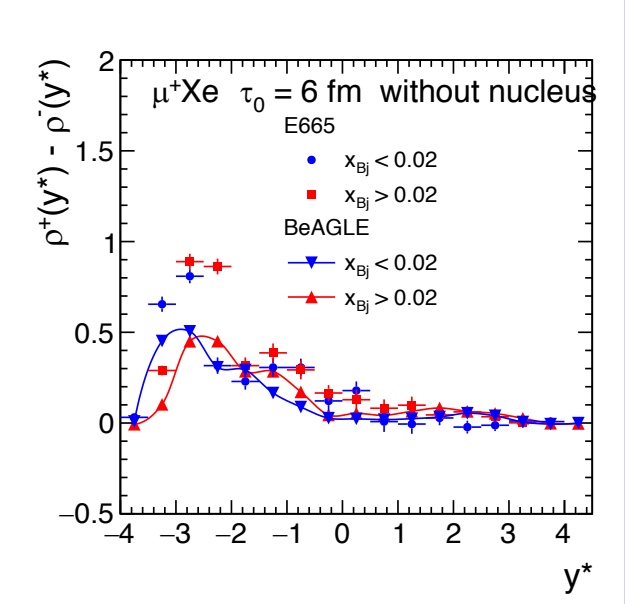
Without nucleus:



Without nucleus, agreement (peak position) is seen for both shadowing and non-shadowing region, although magnitude is very off.

- In the rapidity region y*~-3, nucleus dominates, especially the large remnant nucleus.
- In the E665 paper, there is no description about nucleus detection.
- Did they can detect all the nucleus? How about the residual nucleus? Efficiency and acceptance loss? Paper didn't mention them.

With tau0=6fm

	94 paper	95 paper
Hadronic net charge with tau0=6fm Without nucleus		
	Peak is in different position Peak position: BeAGLE: -3.0<y*<-2.5 E665: -2.5<y*<-2	Without nucleus, agreement (peak position) is seen for both shadowing and non-shadowing region, although magnitude is very off.

Paper structure (on this topic)

1. BeAGLE true distributions

(and discuss what physics they are sensitive to, connection to EIC, etc)

	Rapidity distribution (dN/dy*)	Net charge distribution (d<Q>/dy*)	dN/dy* (Xe-D)
All charged particles	✓	✓	✓
Different particles ($\pi^+, K^+, p, nucleus$)	✓		
x_{Bj} dependence	✓	✓	✓
Different shadowing options dependence (optional)	✓	✓	✓
Tau0 dependence (optional)	✓	✓	✓

2. How well have we validated the beagle results

- ✓ Introduce the E665 experimental details, the kinematics quantities, the mass assumption
- ✓ BeAGLE vs. E665, the rapidity comparison, net charge distribution, difference between muXe and muD
- ✓ Possible explanation: how nucleus detection, correction…
- ✓ We have limited data to verify it, so EIC…